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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,909	09/29/2006	Motoyasu Nagano	MAT-8911US	8315

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EXAMINER	
DANG, KET D	

ART UNIT	PAPER NUMBER
3742	

MAIL DATE	DELIVERY MODE
12/14/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,909	NAGANO ET AL.	
	Examiner	Art Unit	
	KET D. DANG	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-8* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-8* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *29 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08a) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to the amendment filed on October 11, 2011. As directed by the amendment: claims 1-8 have been amended, no claims have been cancelled and no new claims have been added. Thus, claims 1-8 are presently pending in this application.

Response to Amendment/Argument

2. Applicant's amendments/arguments filed October 11, 2011 have been fully considered but they are not persuasive.

Applicant's amendments have overcome the 35 U.S.C. 112, second paragraph rejections from previous Office Action.

Applicant argues on pages 10-11 of the Arguments/Remarks that Kawamoto does not teach or suggest control of voltage in a short-circuit period. Examiner agrees with the argument. However, the limitation is disclosed by Needham (see page 10 of the last Office Action), not Kawamoto as discussed in the Office Action.

Applicant argues on pages 11 of the Arguments/Remarks that Blankenship does not teach or suggest control of voltage in a short-circuit period. Examiner agrees with the argument. However, the limitation is disclosed by Needham (see page 10 of the last Office Action), not Blankenship as discussed in the Office Action.

Applicant argues on pages 11 of the Arguments/Remarks that Churchward does not teach or suggest control of voltage in a short-circuit period. Examiner agrees with

the argument. However, the limitation is disclosed by Needham (see page 10 of the last Office Action), not Churchward as discussed in the Office Action.

Applicant argues on pages 12 of the Arguments/Remarks that Needham does not teach or suggest control of voltage in a short-circuit period. As discussed in the Office Action, Needham teaches the voltage can be controlled by either increased or decreased voltage supply in a short-circuit period (col. 3, lines 25-49).

Therefore, the combination of Kawamoto in view of Blankenship, Churchward, and Needham fully meets all of the claimed limitations.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto (JP 410109163 A) in view of Blankenship (US 6,248,976 B1), Churchward (US 1,687,492), and Needham (US 4518844).

5. Regarding claims 1 and 5, Kawamoto discloses a consumable electrode type arc welding machine which makes use of an arc generated between a base metal of welding and a wire supplied thereto (para. 0002-0003), the machine comprising: a welding voltage detection circuit for detecting a welding voltage and outputting a welding voltage detection signal (Paragraph 3, lines 4-5); a welding current detection

circuit for detecting a welding current and outputting a welding current detection signal (Paragraph 3, lines 7-9); a short-circuit arc judgment circuit for outputting a short-circuit arc judgment signal, after accepting the welding voltage detection signal and judging whether the machine is in a short-circuit state or in a arc state (Paragraph 3, lines 5-7); a short-circuit waveform control circuit for outputting a short-circuit waveform control signal after accepting the welding current detection signal (Paragraph 3, lines 9-10); an arc waveform control circuit for outputting an arc waveform control signal for an arc period after accepting the welding voltage detection signal (Paragraph 3, lines 10-12); and a first switching circuit 11 (Fig.1) which accepts the short-circuit waveform control signal and the arc waveform control signal and selects the arc waveform control signal in the arc period or the short-circuit waveform control signal in a short-circuit period based on the short-circuit arc judgment signal, and outputs a selected signal (Paragraph 6, lines 15-17); wherein a welding power 5 (Fig. 1) is controlled by the selected signal output from the first switching circuit 11 (Fig. 1), a constant-current control period setting unit outputting a constant-current control period signal which indicates a constant-current control period (Paragraph 6, lines 7-8), a constant-current circuit for outputting a constant-current signal for implementing a certain specific constant-current value after accepting the welding current detection signal and based on the inputted welding current detection signal (Paragraph 6, lines 8-13); and a second switching circuit for selecting 3 (Fig.1) , in accordance with the constant-current control period signal, one of the constant-current signal in the constant-current control period (Paragraph 6, lines 19-20) and the output signal from the first switching circuit 11 (Fig. 1) in a period other

than the constant-current control period, and outputting a selected signal (Paragraph 6, lines 17-19); and the welding power 5 (Fig. 1) is controlled based on the output from the second switching circuit 3 (Fig.1); and wherein when the short-circuit arc judgment circuit judges the machine is in the arc state, the arc waveform control circuit controls the welding current to be held at a constant level when the resistance signal exceeds a second resistance threshold, the constant level current being greater than a normal welding current generated based on the welding voltage (para. 0002-0003).

Kawamoto discloses all of the limitations of the claimed invention as set forth above, except for an resistance calculator for calculating a resistance signal based on the welding voltage detection signal and the welding current detection signal, and the arc resistance signal is delivered to at least one of the short-circuit waveform control circuit and the arc waveform control circuit for controlling the welding power; when the arc resistance signal continues exhibiting a value that is greater than a certain specific value; and when the short-circuit arc judgment circuit judges the machine is in the short-circuit state, the short-circuit waveform control circuit controls the welding voltage to decrease when the resistance signal exceeds a first resistance threshold, controls the welding voltage to increase and the short-circuit period to decrease when the resistance signal is below the first resistance threshold.

However, an resistance calculator for calculating a resistance signal based on the welding voltage detection signal and the welding current detection signal, and the arc resistance signal is delivered to at least one of the short-circuit waveform control circuit and the arc waveform control circuit for controlling the welding power is known in

the art. Blankenship, for example, teaches an resistance calculator for calculating and outputting an resistance signal, and the arc resistance signal is delivered to at least one of the short-circuit waveform control circuit and the arc waveform control circuit for controlling the welding power (col. 2, lines 6-38). Blankenship further teaches such a configuration provides a means the arc length can be maintained during the welding process (col. 2, line 20-23).

Similarly, when the resistance signal continues exhibiting a value that is greater than a certain specific value is known in the art. Churchward, for example, also teaches when the resistance signal continues exhibiting a value that is greater than a certain specific value (page 1, lines 79-81). Churchward also teaches the welding current to be held at a constant level when the resistance signal exceeds a second resistance threshold, the constant level current being greater than a normal welding current generated based on the welding voltage (page 1, lines 67 - page 2, lines 35). Churchward further teaches such a configuration provides a means to overcome such increase in resistance and necessary to supply a greater voltage to the work to maintain a constant flow of current across the arc (page 1, lines 81-85).

Furthermore, when the short-circuit arc judgment circuit judges the machine is in the short- circuit state, the short-circuit waveform control circuit controls the welding voltage to decrease when the resistance signal exceeds a first resistance threshold, controls the welding voltage to increase and the short-circuit period to decrease when the resistance signal is below the first resistance threshold is known in the art. Needham, for example, teaches the short-circuit waveform control circuit controls the

welding voltage to decrease when the resistance signal exceeds a first resistance threshold, controls the welding voltage to increase and the short-circuit period to decrease when the resistance signal is below the first resistance threshold (col. 3, lines 22-33). Needham further teaches such a configuration provides the wire feed speed can be reduced immediately on the onset of the short-circuit or after a delay period and likewise during the arcing period the feed speed can be increased (col. 3, lines 34-37).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kawamoto with calculating an arc resistance of Blankenship in order the arc length can be maintained during the welding process. Similarly, it would have been obvious to one of ordinary skill in the art to modify Kawamoto in view of Blankenship with the welding current to be held at a constant level when the resistance exceeds the resistance threshold, the constant level current being greater than a normal welding current generated based on the welding voltage of Churchward in order to overcome such increase in resistance and necessary to supply a greater voltage to the work to maintain a constant flow of current across the arc. Furthermore, it would have been obvious to one of ordinary skill in the art to modify Kawamoto in view of Blankenship and Churchward with the features above of Needham in order to provide the wire feed speed can be reduced immediately on the onset of the short-circuit or after a delay period and likewise during the arcing period the feed speed can be increased.

With respect to claims 2-4, Kawamoto discloses the claimed invention, including the consumable electrode type arc welding machine, wherein the short-circuit waveform control circuit accepts the welding current detection signal and outputs the short-circuit

waveform control signal (Paragraph 3, lines 9-10), the switching circuit 25 (Fig. 4) selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period (Paragraph 3, lines 12-14), when the short-circuit arc judgment signal indicates the short-circuit period (Paragraph 2, line 3), the switching circuit selects the short-circuit waveform control signal, and outputs the selected signal (Paragraph 3, lines 12-14), the welding power 5 (Fig. 1) is controlled based on the output from the switching circuit; wherein the arc waveform control circuit accepts the welding voltage detection signal and outputs an arc waveform control signal (Paragraph 3, lines 10-12).

With respect to claims 6-8, Kawamoto discloses the consumable electrode type arc welding machine, wherein the short-circuit waveform control circuit accepts the welding current detection signal and outputs the short-circuit waveform control signal (Paragraph 3, lines 9-10); the first switching circuit 11 (Fig. 1) selects the arc waveform control signal when the short-circuit arc judgment signal indicates the arc period, when the short-circuit arc judgment signal indicates the short-circuit period (Paragraph 3, lines 12-14); the first switching circuit selects the short-circuit waveform control signal, and outputs the selected signal (Paragraph 3, lines 12-14), the welding power 5 (Fig. 1) is controlled based on the further selected signal output from the switching circuit; wherein the arc waveform control circuit accepts the welding voltage detection signal and outputs an arc waveform control signal (Paragraph 3, lines 10-12).

Prior Art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Innami et al. (US 5834732) disclose the short-circuit controls the voltage (col. 2, lines 22-33; col. 3, lines 8-18; col. 10, lines 5-25).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KET D. DANG whose telephone number is (571)270-7827. The examiner can normally be reached on Monday - Friday, 7:30 - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoang Tu can be reached on (571) 272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KET D. DANG/
Examiner, Art Unit 3742
December 12, 2011

/Henry Yuen/
Supervisory Patent Examiner, Art Unit 3742